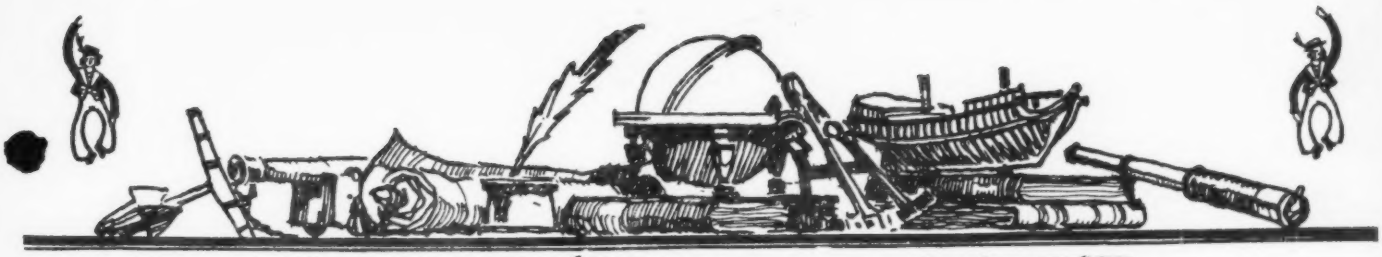
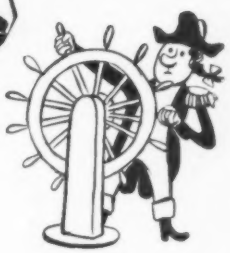


NAUTICAL RESEARCH JOURNAL

PUBLISHED BY THE NAUTICAL RESEARCH GUILD



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LANDOVER HILLS, MARYLAND

Vol. 8 SEPTEMBER 1956 OCTOBER No. 5

One of the "six-bitters" constructed for the U.S. Coast Guard in 1924-25. Built by the Vinyard Shipbuilding Company of Milford, Delaware. This craft was commissioned June 1, 1925. Transferred to U.S. Naval Torpedo Station, Newport, Rhode Island on March 27, 1934. (U.S.C.G. Photograph)

THE DEVELOPMENT OF THE SMALL INSHORE PATROL BOATS OF THE UNITED STATES COAST GUARD

by William D. Wilkinson

Attention from the general public to the vessels of the United States Coast Guard has generally centered on the Service's larger craft - - ocean-going patrol cutters, ice-breakers, buoy tenders, lightships, etc. In the last three to four decades, however, an interesting and extensive development has taken place in the many smaller boats, and it is the intent of this short history to cover the evolution of one type - - the small relatively high speed, inshore patrol boat between 65 and 95 feet in overall length. This is the first of four articles covering the development of these boats through Prohibition, the Depression, World War II and the Cold War.

- Part I -

From World War I Through Prohibition

At the end of World War I, the Coast Guard was a rather small organization with its principal responsibilities of those which had previously belonged to the two organizations united in 1915 to form the present Service: The Revenue-Cutter Service and the Life-Saving Service (1). These responsibilities included such operations as the International Ice Patrol, the Bering Sea Patrol, rescue and assistance missions, maintenance of life-saving stations and the enforcement of customs regulations. Such duties still comprise a large part of the Service's activities, but since those days - many more have been added.

CG-74321 (ex CG-176) as outfitted for patrol duty during World War II. Note 20 mm. anti-aircraft guns mounted fore and aft, depth charges and the flying bridge. Built by the Rice Brothers Corporation, East Boothbay, Maine, she was commissioned April 14, 1925 and assigned to Base 5, Boston, Massachusetts. (U.S. Navy Photograph)

During its early years, the Coast Guard needed few small inshore patrol boats for the duties just described. The first annual report published after World War I (for fiscal year ending June 30, 1920) shows a total of only twenty-seven cutters of this type. Of these, only one was of Coast Guard design - the 85' steam powered, wooden hulled ARCATA, built in 1903. Most of the others were former sub-chasers of the Navy's famous "Splinter Fleet" -- 110' wooden hulled, gasoline powered patrol boats. Designed by Captain A. Loring Swasey USN, of the Bureau of Ships, these 110-footers were really the forerunners of the Coast Guard's own designs for the high speed, inshore patrol boat type. Although most were decommissioned as the Service developed and built its own boats, a small handful did remain in commission right through World War II.

The Coast Guard's initial design for a fast inshore patrol boat resulted from its responsibility for the enforcement of the Eighteenth Amendment and the Volstead Act. As a result of this legislation (2), the smuggling of contraband liquor into the United States became very extensive during the early years of the 1920's. Between April 1922 and June 30, 1925, the Coast Guard confiscated over 213800 cases of alcoholic beverages (3) and no one knows how much additional alcohol was case overboard by pursued smugglers to prevent its use as evidence by the Government.

The Coast Guard was faced with the problem of patrolling over 10,000 miles of coastline, indented with hundreds of bays, inlets and rivers, with equipment that was designed primarily for life and property saving work, wreck, rescue and assistance missions. The equipment was not of suitable design, construction nor speed to permit the overtaking of fast craft employed by smugglers. To remedy the situation, the tactics and strategy of the smugglers were carefully studied, and it was determined that for successful law enforcement, two types of vessels were required. The first was large offshore patrol cutters which could observe and track smugglers far out at sea. Second, employment of small fast inshore patrol boats to pursue the "rummies" as they headed shoreward. It was usually the habit of the rum runners to station their large supply ships well out beyond the twelve mile limit and to transfer their cargo to smaller, faster boats which would then make a run for the shore under cover of darkness or fog.

To meet the need for offshore cutters, the Navy turned over twenty-five older destroyers and the Coast Guard was authorized to construct several new classes of larger offshore cutters of 100' and 125' in overall length (4). To cope with the smaller "blackies", as the rum runners' boats were commonly called, two hundred and three 75' inshore patrol boats were built.

To cover the costs of this extensive program, Congress appropriated $13,850,622 on April 2, 1924 and by an Act of April 21, 1924, authorized the additional personnel necessary to carry it out. That the Coast Guard grew rapidly can be seen by comparing the total number of commissioned cutters in all classes for the years 1920 through 1930 (5).

Year	No. of Cutters In Commission	Year	No. of Cutters In Commission
1920	109	1926	425
1921	110	1927	474
1922	103	1928	450
1923	89	1929	458
1924	77	1930	445
1925	295		

In one year, between 1924 and 1925, the number of vessels in commission jumped over 300% due primarily to the construction of the 75' inshore patrol boats.

The Service's extraordinary growth in this period can also be seen by the increase in personnel (6):

	1920	1924	1925	1926	1930
Commissioed Officers	205	209	229	418	404
Warrant Officers (all grades)	382	420	392	767	868
Petty Officers and all other enlisted men	3,708	5,000	8,230	8,784	10,762
Coast Guard Academy Cadets	23	93	74	40	97
Temporary Surfmen and Substitutes	---	260	---	---	---
Totals	4,318	5,982	8,925	10,009	10,131

The complement of a 75' cutter consisted of eight men: a chief boatswain's mate as commanding officer; a deck force of two boatswain's mates first class, one seaman first class and one seaman second class; an engine room force of one chief motor machinist's mate, one motor machinist's first class and one motor machinist's mate second class. With all 203 seventy-five footers in commission in 1925, over 50% of the approximate 3,000 man increase in personnel that year was absorbed in manning this new class.

The basic design - arrangement layout, machinery, locations, operational features, weight and other technical aspects - of the 75-foot inshore patrol boats was set down by the Office of the Superintendent of Construction and Repair at Coast Guard Headquarters. In this phase of the work, Alfred Hansen, then Senior Naval Architect responsible for design development of the Service's small boats, was particularly influential.

John Trumpy, at that time naval architect for the Mathis Yacht Building Co., Camden, New Jersey, was commissioned to complete the final plans, including hull lines and specifications, which were then followed by all the boatyards participating in the construction program. Preliminary drawings and specifications were turned over to Trumpy in early March 1924. At the end of the month, a meeting of technical representatives of the various boatyards which were to construct the cutters was held, and in early April the final plans were ready for the yards. CG 100 was the first craft completed and commissioned on October 21, 1924. CG-302 was the last and commissioned on July 18, 1925. The construction program was completed in ten months. Seventeen ship yards shared in this splendid production record which averaged five cutters a week. The various yards with the number of boats each built and the successful bid price per cutter were:

Yard and Location	No. of Boats Built	Price Per Boat
1) Mathis Yacht Building Co. Camden, New Jersey	15 (CG-100 through CG-114)	$18,675
2) DeFoe Boat and Engine Works Bay City, Mich.	15 (CG-115 through CG-129)	$20,375
3) Crowinshield Shipbuilding Co. Fall River, Mass.	10 (CG-130 through CG-139)	$21,450
4) Dachel-Carter Boat Company Benton Harbor, Michigan	10 (CG-140 through CG-149)	$21,950
5) T. H. Soule Freeport, Maine	10 (CG-150 through CG-159)	$22,945

	Yard and Location	No. of Boats Built	Price Per Boat
6)	New York Launch and Enginer Co. New York, New York	10 (CG-160 through CG-169)	$23,600
7)	Rice Bros. Corporation East Bothbay, Maine	10 (CG-170 through CG-179)	$23,950
8)	Southern Shipyard Corp. Newport News, Virginia	10 (CG-180 through CG-189)	$24,000
9)	U. S. Navy Shipyard Portsmouth, New Hampshire	3 (CG-190 through CG-192)	$24,140
10)	Chance Marine Construction Co. Annapolis, Maryland	10 (CG-193 through CG-202)	$24,250
11)	Kingston Dry Dock and Construction Co., Kingston, N.Y.	10 (CG-203 through CG-212)	$24,750
12)	Vinyard Shipbuilding Company Milford, Delaware	10 (CG-213 through CG-222)	$24,770
13)	Colonna's Shipyard, Inc. Norfolk, Virginia	10 (CG-223 through CG-232)	$25,000
14)	Luders Marine Construction Co. Stamford, Conn.	10 (CG-233 through CG-242)	$25,675
15)	Gibbs Gas Engine Company Jacksonville, Florida	10 (CG-243 through CG-252)	$26,900
16)	A. W. DeYoung Alameda, California	10 (CG-253 through (CG-262)	$22,167
17)	Lake Union Dry Dock and Machine Works, Seattle, Wash.	15 (CG-263 through CG-277)	$22,800
	Supplemental Contracts		
1)	Mathis Yacht Building Co. Camden, New Jersey	15 (CG-278 through CG-292)	$18,675
2)	Gibbs Gas Engine Company Jacksonville, Florida	10 (CG-293 through CG-302)	$19,445

These bid prices did not include the engine units; therefore, when their cost, plus that of additional equipment and accessories was included, the total price of each 75' inshore patrol boat averaged $35,000.

Thirteen of the boatyards were on the East Coast, two on the Great Lakes and two on the Pacific Coast. Some criticism of this distribution of builders had been voiced by yards on the Pacific Coast; however, with good reasoning, it was pointed out by the Coast Guard that with the greatest amount of smuggling being conducted on the Eastern seaboard, economy, time and strategical factors would be best served by having the cutters built as near as possible to the areas where most needed.

Design dimensions for the 75-Foot inshore patrol boats were:

Length - overall, 74'-11"; between perpendiculars 74'-1"; Beam - 13'-7 1/2"; Draft (maximum) - 3'-9"; Displacement - 37.5 tons.

Although the boats were designed with an eye to inexpensive maintenance, strength and durability of construction was not sacrificed and scantlings were quite generous:

Stem, 5 3/4" - white oak; Keel 5 3/4" - white oak; Deck beams 2 1/4" x 3" - white oak; Frames 2 1/8" x 2 1/8" - white oak (steam bent); Hull planking 1 3/8" - fir or yellow pine; Main decks 1 3/8" x 2 1/4" - fir; Bulwarks 7/8" - fir or yellow pine; Transom 1 3/8" - fir or yellow pine; Stringers 1 3/8" x 5 1/2" - yellow or Oregon pine; Breasthooks, knees, etc. - oak or hackmatack.

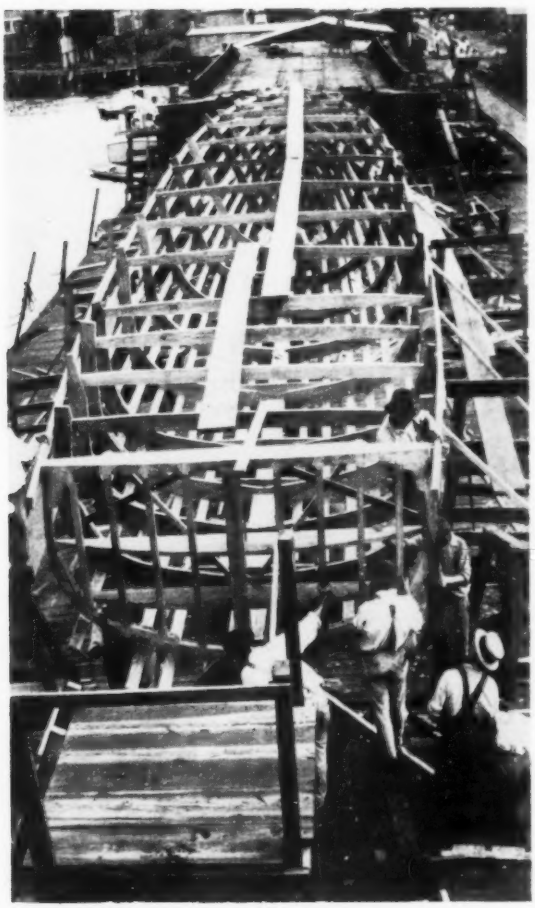
The 75-Footers were twin screw cutters powered with two Sterling "Coast Guard" six cylinder gasoline engines each of 200 HP at 1200 RPM (7). On trial runs the boats made a top speed of 15.7 statute miles per hour. The Coast Guard contracted directly with the Sterling Engine Co. of Buffalo, N.Y. for the construction of 350 engines at a cost of $4,129 each ($1,455,255). Each yard then received from the Service a number of engines sufficient to equip the boats it had under construction. Since 203 craft were finally constructed, a supplemental contract had to be negotiated with Sterling to complete enough units for all, plus additional spares.

Flush decked with a low forward bulwark, the boats had a squarish wheelhouse forward and two trunk cabins aft, over the engine room and the after quarters. Their somewhat angular appearance was no indication of their ability to cope with the worst of weather, however, Designed for operational conditions met in coastal waters about 20 miles offshore, the cutters combined great seaworthiness with relatively high speed. How seaworthy was demonstrated early in their history. In an exceptionally heavy gale on January 24, 1925, CG-125 was abandoned by her entire crew 40 miles east of Boston Lightship. Five days later, on the 29th, she was picked up by C.G. Cutter ACHUSHNET 27 miles from Highland light, Cape Cod. In his report of the salvage operation, the Commanding Officer stated:

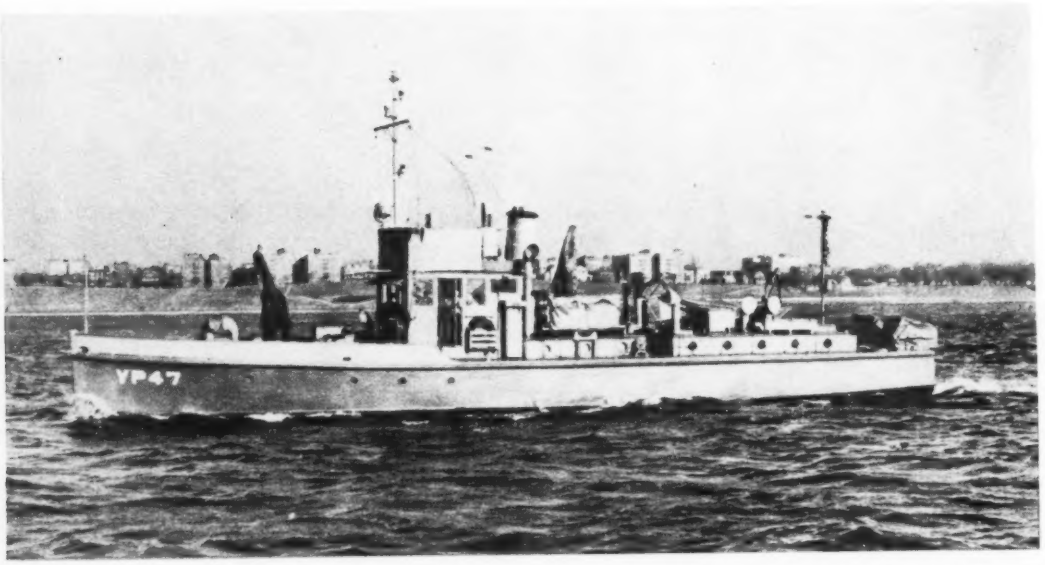
> "When the CG-175 was sighted she was riding easily with her port quarter to wind and sea. The wind was blowing fresh with moderate sea. An inspection of the vessel showed her in apparently good condition. There was some water in the engine room space and after part of crew's space about up to floor boards. All other compartments were dry. The port pilot house door was swinging open, the forward companionway hatch was open, the hatch abaft the engine room was open and the manhole cover of the after compartment was missing. There was no food or gasoline on board. The personal effects of crew and bedding were missing.
>
> The fact that the CG-175 rode through two gales before it was picked up and then towed through two intense gales by the ACUSHNET without any damage, speaks well for the sturdy construction of these boats."

From October 9th through 11th of the same year, another unusually violent gale rages in the area around Nantucket and four 75-Footers were caught out. Two, CG-128 and CG-134, were abandoned by their crews who were rescued by the SS CAMERONIA and the SS REPUBLIC. In each instance, the cutters were later recovered intact and suffering only superficial damage.

Construction views of CG-243 while being built at the Gibbs Gas Engine Company yard, Jacksonville, Florida. She was commissioned November 29, 1924 and assigned to Section Base 6, Miami, Florida. (Photographs from U.S. National Archives)



YP-47, an ex-"six-bitter" turned over to the U.S. Navy and operating on patrol in the Narrows off Bay Ridge, Brooklyn, N.Y., during World War II. Note additional armament, flying bridge and stack which resulted from a re-powering to diesel engines. (U.S. Navy Photograph)



CG-403 A starboard quarter view of the fourth "400" boat. (U.S. Coast Guard Photograph)

In 1925 and 1926, the Coast Guard commissioned 21 section bases from which to operate the new 75-Footers. Although a few of the bases were at locations where Service installations already existed, the major ity were completely new. Section bases were needed as a large part of the operations were carried out from stations designed primarily for life saving purposes. Usually such stations were located on or near open ocean and in many instances, not strategically near the most active centers of smuggling. Also, they had neither mooring accommodations nor service and maintenance facilities required by larger boats such as the 75-Footers.

Section bases were operated on a very flexible basis and often remained in commission for as short a period as one year. Sometimes the base would be moved from one location to another as conditions necessiated. By way of example, Section Base 1 was located at Atlantic City, New Jersey from 1925 through 1927, then discontinued until 1932 when it was relocated at Galveston, Texas for a year. At various times, Section Base 3 was located at Greenport, New York; Nantucket, Massachusetts and Charleston, South Carolina. Most of the bases had been discontinued by 1934, but three remained in commission until 1939: - Base 4 at New London, Connecticut; Base 6 at Fort Lauderdale, Florida; and Base 11 at Oakland, Calif.

Upon commissioning, the 75-Footers were initially assigned to the various Section Bases as follows:

Section Base	Original Location	No. of Boats
Base 1	Atlantic City, New Jersey	16
Base 2	Rockaway Inlet, New York	24
Base 3	Greenport, L.I., N.Y.	20
Base 4	New London, Connecticut	23
Base 5	Boston, Massachusetts	15
Base 6	Miami, Florida	9
Base 7	Gloucester, Massachusetts	12
Base 8	Norfolk, Virginia	11
Base 9	Cape May, New Jersey	18
Base 10	Port Townsend, Washington	5
Base 11	San Francisco, California	9
Base 12	Anacortes, Washington	4
Base 13	Port Angeles, Washington	6
Base 15	Biloxi, Mississippi	7
Base 16	Rockland, Maine	1
Base 17	San Pedro, California	1
Base 18	Woods Hole, Massachusetts	7
Base 19	Key West, Florida	3

In addition, ten were assigned to the Great Lakes, one to Puerto Rico and one to patrol out of Bay Shore, Brooklyn, N.Y. Bases 14, 20 and 21 were not established until after all the 75-Footers had been commissioned.

The list of initial assignments shows that about 50% of these cutters were allocated to bases situated between New London, Connecticut and Cape May, New Jersey. This was the Coast Guard's answer to one of its most serious problems in the enforcement of Prohibition for here was being conducted the most active and extensive smuggling in the country. So successful was the Service in reducing the illicit traffic in this area that it was able to note in its annual report for the fiscal year ending June 30, 1925, "The notorious rum row formerly lying off the entrance to New York, and off Long Island and New Jersey, has been effectively scattered".

As smuggling activities were gradually brought under control, the need for all the 75-Footers to remain in commission diminished and with the repeal of the Eighteenth Amendment on December 5, 1933, all but 40 craft were decommissioned.

The Coast Guard had discovered that these patrol boats were well adapted to carry out other functions required of the Service and those remaining in commission were busy on harbor patrols, boarding duty, regatta patrols, assistance work and the like. Although most of the cutters decommissioned were sold out of the Service to the general public, many other government organizations found them useful and by 1934, forty-six had been transferred to the U.S.Navy; seven to the U.S.Coast and Geodetic Survey; one to the Department of Interior, Intelligence Division; one to the U.S.Army Signal Corps; three to the Department of Justice, Bureau of Prisons;and one to the Department of Commerce, Bureau of Fisheries. Those transferred to the Navy were used in the training of reserve personnel; several were assigned to the Naval Academy at Annapolis, Maryland for use by midshipmen and others found duty as district patrol craft (YP's). Many of those transferred to the Navy remained in active duty right through World War II as did those still in commission in the Coast Guard. At the time of Pearl Harbor, about 46 were still operating in various Coast Guard districts and continued to serve throughout the war carrying out inshore convoy patrols, air-sea rescue work, anti-submarine patrols and port security duties.

By early 1946, the last of the 75-Footers had been sold out of the Service. Almost a quarter of all those constructed had remained in commission long enough for twenty years of active duty. "Merchant Vessels of the U.S. - 1955" lists 42 ex-75-Footers still operating for private owners as yachts, fishing boats, frieghters, passenger boats, and in oceanographic research work, oil exploration and other miscellaneous functions. The 1955 edition of "Jane's Fighting Ships" lists six ex-75-Footers as being in commission in the naval forces of the Dominican Republic and one in the service of Nicaragua. Apparently all are being used for coast guard type duties, still operational thirty years after construction!

Although smuggling in the New York area had generally declined by 1930, there was still quite a bit of activity in the waters of upper Long Island Sound. Here, the "rummies" had developed their boats to such a high degree, that the 75-Footers, now popularly known throughout the Service as the "six-bitters", were no longer able to successfully cope with them. An improved patrol boat was needed and Coast Guard Headquarters developed preliminary specifications and the overall design requirements for a class of 78-foot special inshore patrol boats. Numbered CG-400 through CG-405, they became known as the "400" boats.

In the fall of 1930, requests for construction bids went out to the boat building industry and on November 26th, it was announced that the Southern Shipyard Corporation of Newport News, Virginia had been awarded the contract (9). This yard agreed to build the six cutters at a cost of $49,000 each (including engines, machinery, equipment and other non-government furnished accessories), had already acquired experience in building for the Coast Guard having completed ten of the "six-bitters" in 1924-1925 and the 101' steel lighthouse tender BEECH in 1927-1928. Under provisions of the construction contract, the successful yard was required to designate a naval architect to draw up the complete plans, construction details and final specifications (10). Southern Shipyard turned this responsibility over to Eldredge McInnis of Boston, Massachusetts, and to Walter McInnis of that firm goes the credit for the development of the fine lines of these boats which can be studied from the plans accompanying this article.

Specifications for these craft were: Length, overall, 78'-9", waterline, 78'-0"; Beam, 14'8"; Draft 3'-11"; Displacement, 43 tons. Operational experience with the 75-Footers had revealed that relatively high speed and seaworthiness were of more importance than great cruising range and extensive crew accommodations. Accordingly, these latter features were somewhat sacrificed in the 78-Footers to allow for the use of twin Sterling Viking II gasoline engines. These large 8 cylinder units, each developing 506.4 brake horsepower at 1200 RPM, drove the new cutters to a top speed of 24 statute miles per hour on their trial runs. The improvements over the original design - e.g. increased horsepower, longer waterline length and finer hull lines - are now seen as it is to be remembered that the 1924 boats had a maximum speed of only 15.7 statute miles per hour.

In outward appearance the "400" boats had a somewhat longer and lower look, due not only to the increased overall length, but also to the elimination of the second trunk aft. Greater rakishness in the design of the wheelhouse also presented a more trim silhouette than heretofore, but still present were the raised bulwarks and straight stem. The cutter's boat, a 17' Swampscott dory, was mounted on the main deck aft, eliminating the davit arrangement on the trunk cabin of the "six-bitters". Instead of masts fore and aft, a single stick was mounted immediately aft the wheelhouse. As with the earlier boats, principal armament consisted of a one pounder mounted forward, a 30 cal. machine gun and small arms for the crew.

Personnel from Coast Guard Headquarters and Eldredge-McInnis visited the yard frequently to observe construction progress. The cutters were of practical design to facilitate easy maintenance and repair. Every effort was made to complete them with a high degree of skilled workmanship as well as the best of materials and fittings. The boats had unusually strong fastenings throughout in order to insure their ability to cope with the worst operational conditions.

Construction specifications and scantlings of the 78-Footers were quite substantial for vessels of their size:

> Stem 5 3/4" white oak; Keel 5 3/4" white oak; Deck beams of white oak; Frames 2 1/8" x 2 1/8" steam bent white oak; Hull planking 1 5/16" fir; Main decks 1 3/8" x 2 5/8" fir; Bulwarks 7/8" fir; Transom 1 5/16"; Stringers - two per side - 1 1/2" x 6"; Breathooks, knees, etc. 3" hackmatack or oak; Guards 3 1/2" x 3" yellow fir; and four watertight bulkheads of galvanized iron.

The cutters completed their trial runs successfully and as each boat was outfitted and accepted by the Service, she departed with a permanently assigned crew, under power for New London. Prior to the completion of the boats, the crews had arrived at Newport News to familiarize themselves with the vessels and the advanced engine installations. Each cutter had a complement of six men, all of whom were carefully selected and especially trained; a chief boatswain's mate as commanding officer; a deck force of one boatswain's mate first class and two coxswains; an engine room force of one chief motor machinist's mate and one motor machinist's mate first class.

The first cutter completed was CG-400 and arrived for duty at New London on June 6, 1931. The last, CG-405, tied up at her mooring September 22nd. From 1931 until late 1936, the "400's" operated together as a unit under the New York Division out of Base 4, New London. Handled by smart and able crews, these fast and seaworthy craft were quite successful in carrying out the duties for which they had been designed and built. Their presence in the outer water of the approach to Long Island Sound further aided the decline of smuggling in that area which was, by the end of Prohibition in late 1933, well under control.

A typical incident involving the "400" boats in the chase of a "rummy" is described in a narrative report to the Commandant from the Commanding Officer of the CG-400 concerning the seizure of the smuggler LADY HAMILTON on August 29, 1932:

> "On the morning of August 29, 1932 at 1:40 A.M., the CG-832 in charge of chief boatswain's mate James W. Davis, sighted a speedboat 3.5 miles SE of Little Gull Island. Immediately gave the usual signals to hail the vessel, using flares and searchlight displayed on the speedboat. The speedboat failed to heed these signals, put out a smoke screen and went ahead full speed. The machine gun was then used and the boat chased with the CG-832 having 3 Liberties wide open. Was unable to overtake the speedboat. Sacks were seen on her deck.

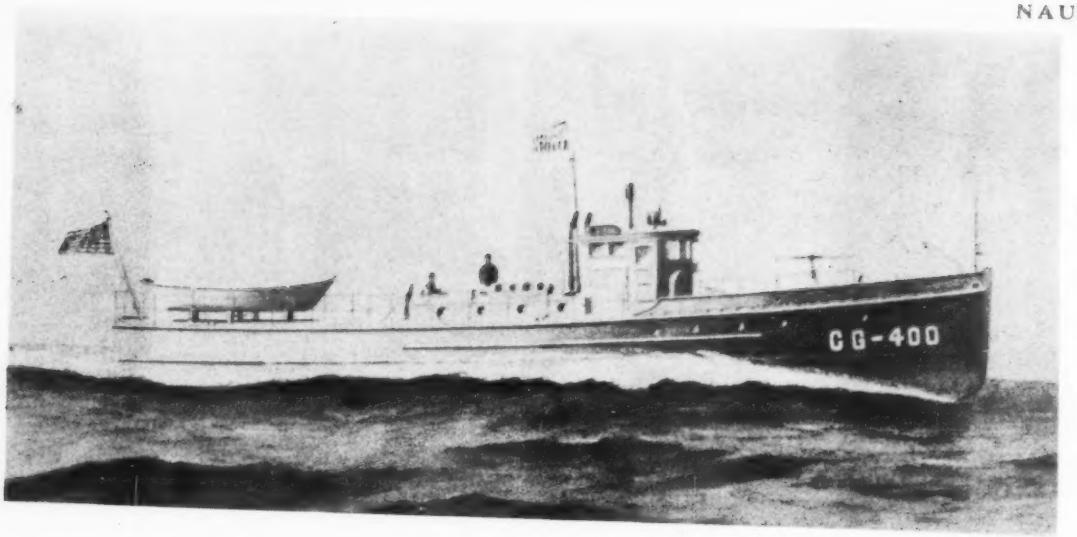
"At 1:50 A.M., 29 August, 1932, she was sighted by the CG-400, three miles east of the Ruins Gas Buoy, Gardiners Island, Block Island Sound, coming up from astern. The CG-400 turned to head her off, running in on her. The usual signals were given to hail a boat, blanks used and the searchlight put on her, then a shot fired across ahead of her and then fired into her. She put out a smoke screen and escaped. The CG-400 took up the chase. Sacks were observed just aft her pilot house and her name, LADY HAMILTON, was plainly seen in the searchlight beam.

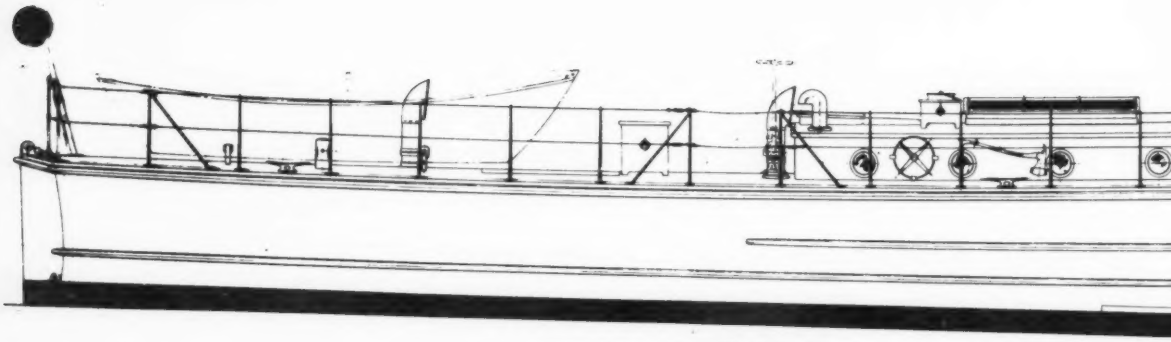
"At 2:05 A.M., 29 August, 1932, she was sighted by the CG-405 in charge of chief boatswain's mate Christopher J. Barrett, 2 miles south magnetic of Orient Point Light, L. I., N.Y. The usual warning signals were given and then she was fired upon. Sacks were seen on her deck and the CG-832 was observed still after her. She passed about 150 yards from the CG-405.

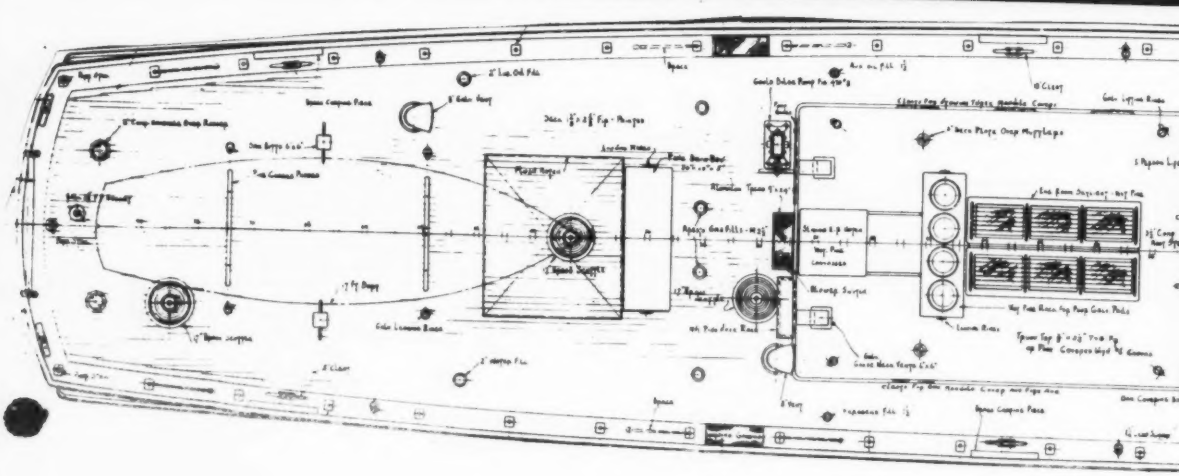
"At 2:10 A.M., 29 August, 1932, she was up to the CG-403 in charge of chief boatswain's mate Ulric F. Engman and barely missed a collision, passing within 23 yards of that vessel. As she approached, the usual warnings were given and the searchlight put on the speedboat. She was throwing a smoke screen and escaped. The CG-403 also fired into her with a 1-pounder and machine gun. She ran to the southward in Gardiners Bay, then swung around to the northwestward and by the breakwater in Greenport, L.I., N.Y. Here she was lost. The name LADY HAMILTON was plainly seen on her bow and sacks were piled aft the pilot house. All boats immediately gathered in Greenport Harbor and searched that out thoroughly. The CG-400 searched in Shelter Island Sound and down into Little Peconic Bay where she found the ARTEMIS at New Suffolk. She then proceeded to South Jamesport in Great Peconic Bay, searching for the LADY HAMILTON. Here she was found, anchored among the yachts, just off the beech, with no one on board. Her engines were warm and she was shot up and showed where she had been hit in the chase. A shall had taken out two pilot house windows and had knocked her white headlight off her bow and had pierced the deck and was found imbedded in the wood. She showed machine gun holes all done recently. There was broken bottle glass about, showing where the deck load had been hit. The top of a pint bottle was found, the neck of which had been shot off without injuring the cap marked BOURBON, Mellwood Whiskey, and there was part of the cardboard covering for the bottles. She had been cleaned and washed out but these escaped their hurried efforts. The above was held in evidence.

"The boat was seized and a prize crew put on board and sent back to New London, Connecticut. She was found at 7:00 A.M. daylight time."

With Prohibition's end, the need for the "400" boats at New London declined. Several 75-Footers and larger craft were permanently stationed there and were sufficient to carry out other regular duties of the Coast Guard. However, cutters of the larger type were needed on the West Coast so in October of 1936, the six "400" boats were permanently transferred to the Pacific area for duty under the Coast Guard Captains of the Port at Honolulu, Hawaii; Oakland, California and Port Angeles, Washington. CG-400 and CG-403, assigned to Honolulu, were shipped aboard the SS MAUNA LOA, sailing from New York on October 14th and arriving at the Islands on November 17th. CG-401 and CG-405, assigned to Base 11, then located at Oakland, were shipped aboard the SS PRESIDENT HAYES of the Dollar Line, sailing from New York on October 2nd and arriving at their new station on November 21st. CG-402 and CG-404 were transferred to Base 13 at


CG-400





PUBLICATION
Nautical Research Journal

Secretary-Treasurer
JAMES W. HARBIN, JR.
4119 Beall Street
Landover Hills, Maryland

SPECIAL INSHORE PATROL BOAT
FOR
U. S. COAST GUARD

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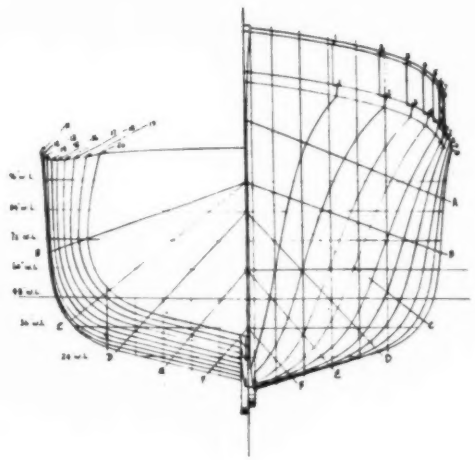

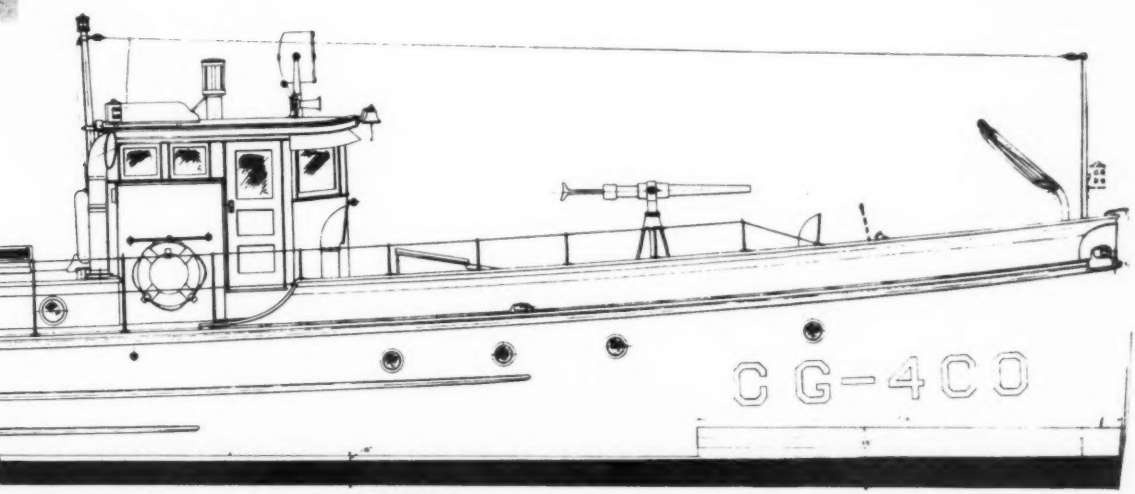

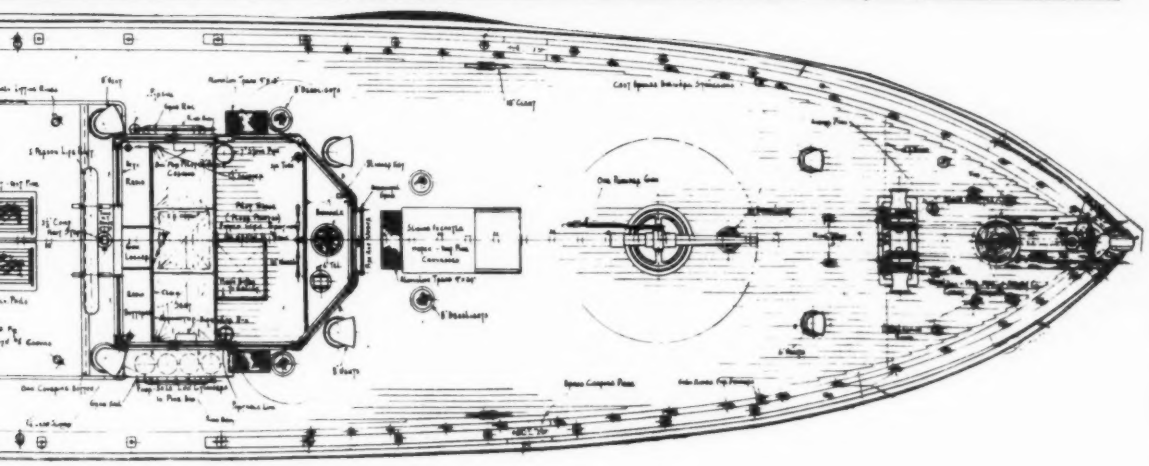

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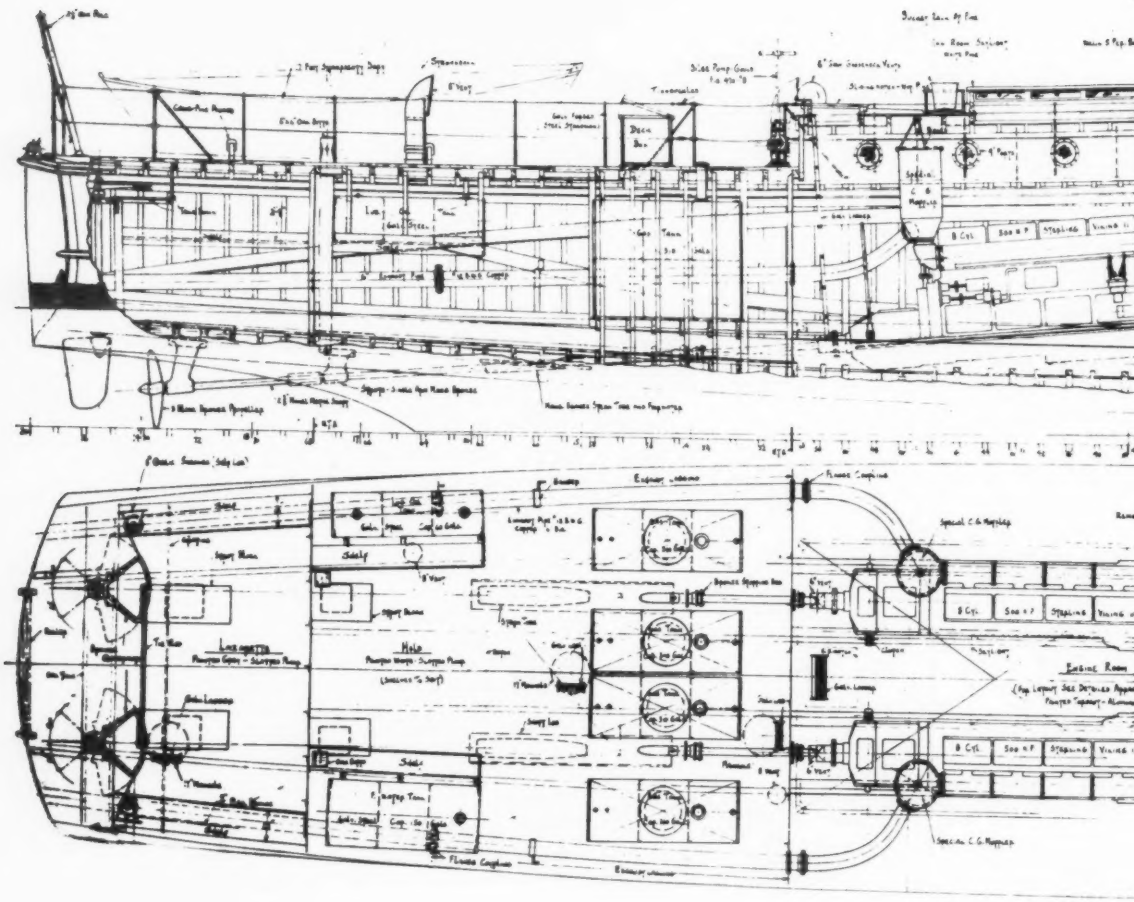

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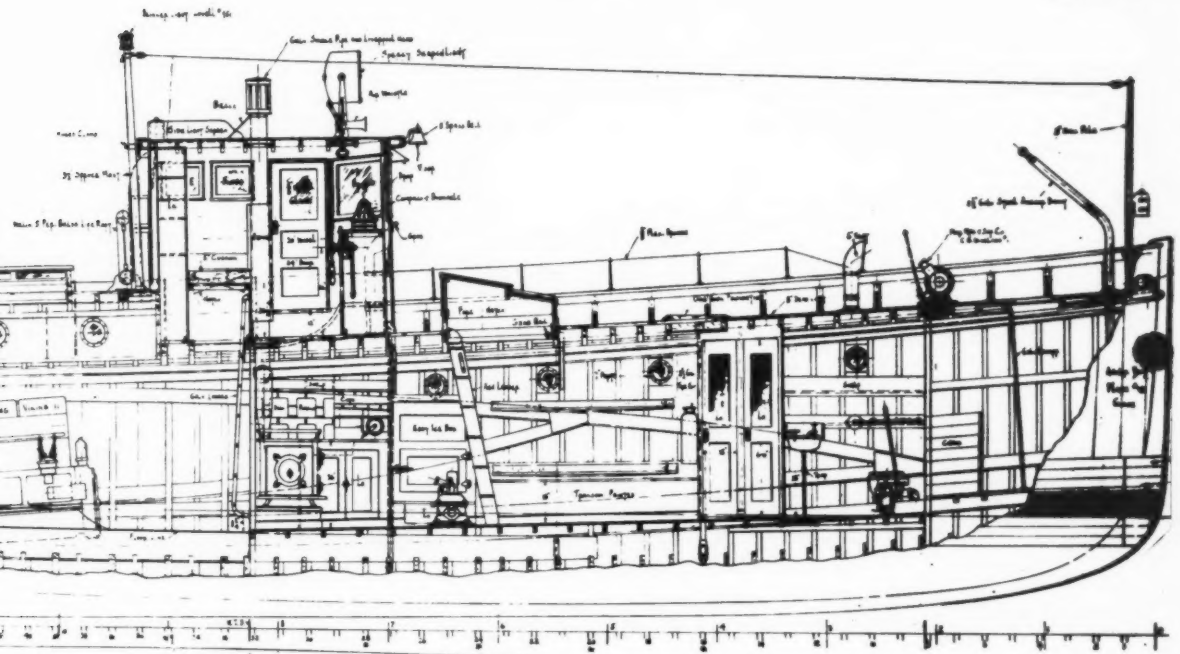
D BY THE NAUTICAL RESEARCH GUILD

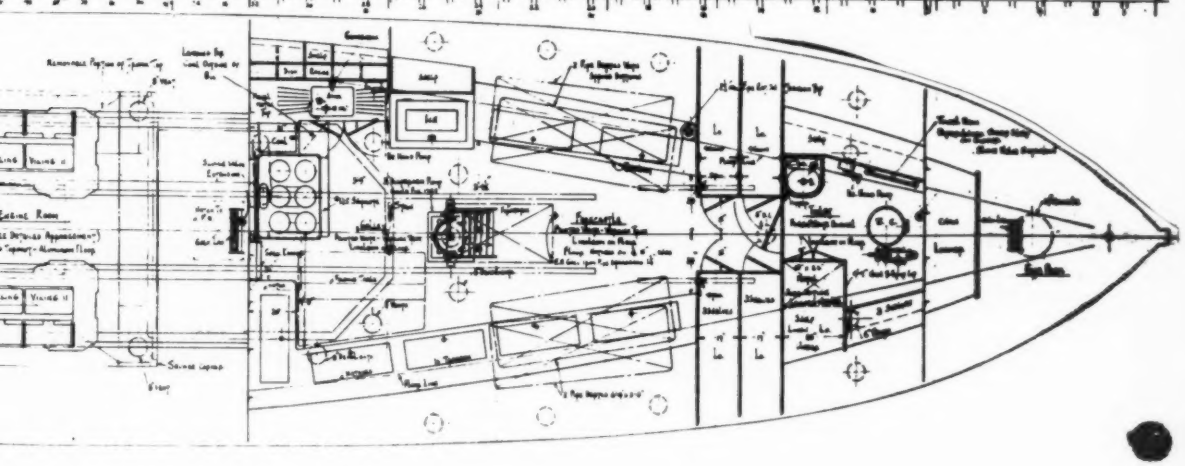
ECIAL INSHORE PATROL BOAT

FOR

U. S. COAST GUARD

PLANS FURNISHED BY THE U. S. COAST GUARD
ORIGINAL DRAFTS PREPARED TO SCALE
OF 1/2" = 1'-0" BY SOUTHERN SHIP-
YARD, NEWPORT NEWS, VIRGINIA





Port Angeles and were shipped out on the SS POMONA of the Weyerhauser Line and arrived in December of 1936.

On November 1, 1941, the "400" boats went under the operational jurisdiction of the U.S.Navy (11), and in addition to their former Coast Guard duties were added anti-submarine patrols, convoy escort work, port security as well as more search and rescue work. During the early days of the war, the "400" boats and other similar classes of small cutters filled a critical place in the rapidly expanding Navy which at that time had few small patrol boats available for escort and convoy operations. However, the powerful engines of the 78-Footers consumed large quantities of scarce gasoline thus restricting their cruising range and limiting their effectiveness as convoy patrol vessels. Crews quarters were not designed for prolonged stays offshore, and hull construction had not included essential bracing to support many newly developed heavy anti-submarine weapons. As soon as possible thereafter, especially designed Navy subchasers took over the task of convoy work and the cutters were released for operations similar to those for which they had been originally designed.

The end of World War II brought to completion 14 years of active Coast Guard duty for the "400" boats. Newer cutters with greater speed, up-to-date equipment and more adequate crews quarters were better suited for carrying out the postwar responsiblities of the Service. CG-400 and CG-403 were decommissioned at Honolulu on January 3 and February 12, 1946 respectively. CG-401 and CG-405 had their ensigns lowered at Alameda on October 4 and October 23, 1945, while CG-402 and CG-404 saw their last Service days at Seattle on February 20, 1946 and December 10, 1945. In storage at the bases for period ranging from 12 to 27 months, the six cutters were sold from the Service on the following dates: (12)

CG-78300 (ex-400)	April, 1947	CG-78303 (ex-403)	May, 1947
CG-78301 (ex-401)	January, 1948	CG-78304 (ex-404)	July, 1946
CG-78302 (ex-402)	April, 1946	CG-78305 (ex-405)	January, 1948

Since being sold out of the Service, the 78-Footers have had careers similar to those of the ex-"six-bitters". CG-400 was last listed in the "Merchant Vessels of the U.S." as the OSPREY, No. 253327 of Honolulu. Her final fate is not known as she is no longer carried in the Register. CG-401 was sold to a San Franscisco Marine engineer George Lourakis, who converted her into a commercial fisherman named LOURAKIS, serial number 255324. The craft was operated as such successfully up and down the West Coast until October 2, 1951 when she piled up at the foot of sheer cliffs along a most inaccessible part of the coast below Fort Bragg in northern California. The ship was a total loss and the crew barely escaped with their lives.

CG-402 was transferred to the Mount Rainier Council of Boy Scouts of America, Tacoma, Washington for use in the training of Sea Scouts. Named the CHARLES N. CURTIS, No. 253102, she has been repowered with twin Buda diesels each of 150 hp. The lazarette, aft number 4 bulkhead, has been converted into sleeping quarters for eleven boys and there are accommodations for a total of twenty-two during cruises. The Sea Scouts, between 14 and 18 years of age, perform complete boat and engine maintenance which along with the shiphandling and watch standing gives them a sound maritime education. They have found the ship to be a good sea boat though one which rolls a bit too much for a vessel her length.

CG-403 and CG-404 are listed in the 1955 Register as the SEA HAWK, No. 262093 of Honolulu and the GOLDEN PLOVER, No. 350985 of Tacoma. CG-405 was never registered after being sold from the service and her final disposition is unknown. Thus, twenty-five years after their construction, three of the "400" boats are still in use, one has been lost and the fate of the remaining two is undetermined.

It might be of interest to note in closing this first chapter in the development of the Coast Guard's small, relatively high speed inshore patrol boats that Prohibition not only was one of the major impetuses in the design of these cutters, but also a factor in developing several other aspects of the Service. This experiment in social legislation helped create a permanent increase in the size of the Coast Guard and was instrumental in development of tactics in the use of small fast patrol boats, training of personnel in small boat handling, and landing techniques. This era also marked the beginning of the aerial survey branch and the expension of an excellent communications and intelligence system. The achievements of the Coast Guard during this period proved to be of immense value in World War II.

Notes of Chapter 1.

1. In July 1939, the Lighthouse Service was transferred from the Department of Commerce to the Coast Guard. In 1942, the Bureau of Marine Inspection and Navigation was brought in on a temporary basis from Department of Commerce and the transfer became permanent in 1946.

2. The Volstead Act instituting Prohibition was passed by Congress in September 1919, following ratification of the Eighteenth Amendment.

3. "Annual Report of the U. S. Coast Guard, 1925" - page 13.

4. "Annual Report of the U. S. Coast Guard, 1926" - pp. 34-35. Twenty destroyers were transferred in 1924 and five more in 1926.

5. "Annual Reports of the U. S. Coast Guard, 1920-1930".

6. Ibid.

7. The first gasoline engine used by the Service was installed in a 34' self-righting life boat in 1899. Although other installations were made between that year and 1924, the first really highspeed units used in any vessel of the Coast Guard were the Sterling "Coast Guard: engines of the 75-Footers.

8. Conversation with C.G. personnel on active duty during World War II, and perusal of Service correspondence in that same period indicate the 80 and 83-Footers of 1937 and 1941 were considered by many to be "400" boats. Official documents of the early '30's however, clearly indicate that the 78-Footers were the original "400" boats.

9. The Southern Shipyard was founded in November 1918 and an excellent history of the yard titled "Brief History of the Southern Shipyard Corporation" by James P. Goodwin, published in 1934, is on file at Mariners Museum, Newport News, Virginia.

10. When the "six-bitters" were built, some boatyards felt that better vessels would have resulted had they been allowed to appoint their own naval architect who would have been responsible for completing the lines and plans from general specifications set down by Headquarters. Therefore, when the 78-Footers were built, the yard awarded the contract was allowed to select the architect. Walter McInnis had achieved professional recognition in Coast Guard deisgn work having completed plans for a class of 36' picket boats, built in large numbers during 1924 and 1925.

11. On several different occasions, the latest in August 1949, Congress reaffirmed the Coast Guard's military status. At all times considered a branch of the nation's land and naval forces, the Service operates under the Treasury Department in times of peace and under the Navy during periods of warfare or during such periods as the President of the United States shall direct.

12. In 1942, the Coast Guard revised its numbering system for small boats and patrol cutters. Overall length was indicated by the first two digits. If the boat was designed and built for the Coast Guard, the third digit was numeral 3, 4, 5, etc. depending upon whether there were less than 100, 100 to 200, 200 to 300, etc. boats constructed in the class. The remaining digits were assigned consecutively throughout the class. For example, the "400" boats were designated CG-78300 through CG-78305. The "six-bitters" remaining in commission during the early '40's were CG-74300 through CG-74349.

Color Scheme

For those who may find the "400" boats of interest for a ship model, the color scheme of the class as painted in 1931 is hereafter provided. This scheme was carried up to World War II when all were painted the dark grey of wartime naval vessels. The data comes from official specifications:

1.	Outside of Hull above Waterline	Light Grey
2.	Hull Bottom extending 9" above Waterline	Dark Brown Copper
3.	Main Deck (canvas covered, filled and painted)	Light Grey
4.	Sides of Wheelhouse and Cabins	Light Grey
5.	Tops of Wheelhouse and Cabins (canvas covered, filled and painted)	Light Grey
6.	Inside of Hull and Cabins above the flooring, except Wheelhouse	Gloss White
7.	Inside of Wheelhouse	Light Green
8.	Floors of Compartments and Wheelhouse	Dark Grey
9.	Inside of Hull in Chain Lockers and below Flooring	Dark Grey
10.	Woodwork Trim - Bright	Varnished
11.	Principal Fittings -- Mast, Staffs, Ventilators, Hatches, Windlass, Skylight Frames, Bitts	Light Grey
12.	17' Swampscott Dory	Light Grey
13.	Ship's Letters on Bow - 18" high	White
14.	Polished Brass Bell	Natural

Acknowledgements

The material for this article has been based entirely on original sources: records at Coast Guard Headquarters in Washington, D. C., the National Archives, conversations; correspondence with Coast Guard personnel, Walter McInnis, naval architect, and Alfred Hansen, now retired but former senior naval architect for small boats at Coast Guard Headquarters. Walter McInnis who laid down the final design and specifications for the "400" boats very kindly provided me with the Inboard Profile and Arrangement Plan, Lines and Offsets, Specifications and much background data.

Coast Guard Headquarters provided the Outboard Profile and Deck Plan in addition to a detailed history of each cutter.

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The 1956 Model Engineer Exhibition

Comments on the Marine Section of the 31st Annual Exhibition

By John Lang, N.R.G., M.S.N.R.

The entries for this year's London exhibition were as varied as ever. In the entire show were 500 models insured by the organizers for some £30,000 ($84,000) Exhibitors ages ranged from a 10 year old boy exhibiting a model of H.M.S. VANGUARD, 18 inches long, to an 87 year old gentleman showing a Lowestoft Trawler model. Although the models covered the whole field of model engineering, the sections devoted to shipping contained the largest number of exhibits. Working sail and steam vessels were in classes of their own; non-working sail or steam motor vessels in another class, while minatures were judged separately and apart from all other classes.

Nine models were entered in the non-working steam motor ship class. Two bronze medals were awarded. One was for the waterline scenic model of H.M.S. HEDINGHAM CASTLE about one foot long and the other to a model of the paddle steamer SIRIUS. The work on HEDINGHAM CASTLE was very neat, and paintwork quite good with few brushmarks or "nibs" to mar the effect. Particularly clean was the construction in building up the control tower, bridge with "wings" supported on stanchions and the lattice work of the mast. Also, another model in this class that was of interest was the waterline Russian cruiser SVERDLOV that was built from such details as the builder could obtain from various sources.

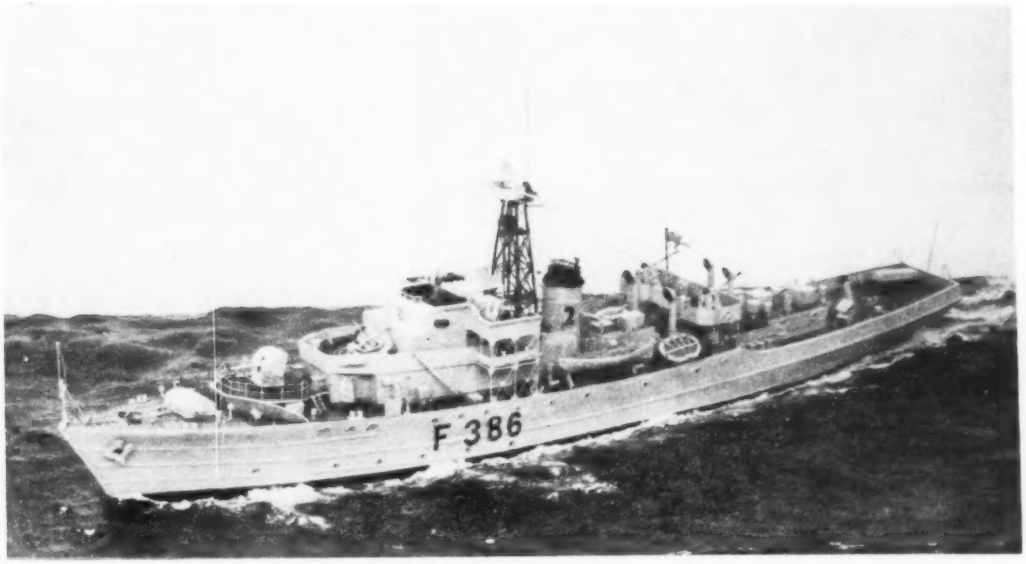
The working steamers class included the championship cup winner ..a steam powered whale catcher built up from tin plate strakes with a powerful twin cylinder engine. This model of a working vessel appeared to be able to stand hard work itself. A silver medal was awarded to a steam-powered drifter trawler which had evidently just appeated in some sailing meet since the finish was not as spic and span as some of the other models. A bronze medal went to a model cabin cruiser of the Thames variety, and in keeping with others of a similar nature, was a highly polished product with an engine installed in place.

Although construction of models from photographs is to be discouraged on the grounds of lack of accuracy, there was one model in this section that had definite appeal. This was of a type entirely different from those in use around the coasts of Britain - and was of a German lifeboat. The builder deserves to be congratulated on his production from such scanty information.

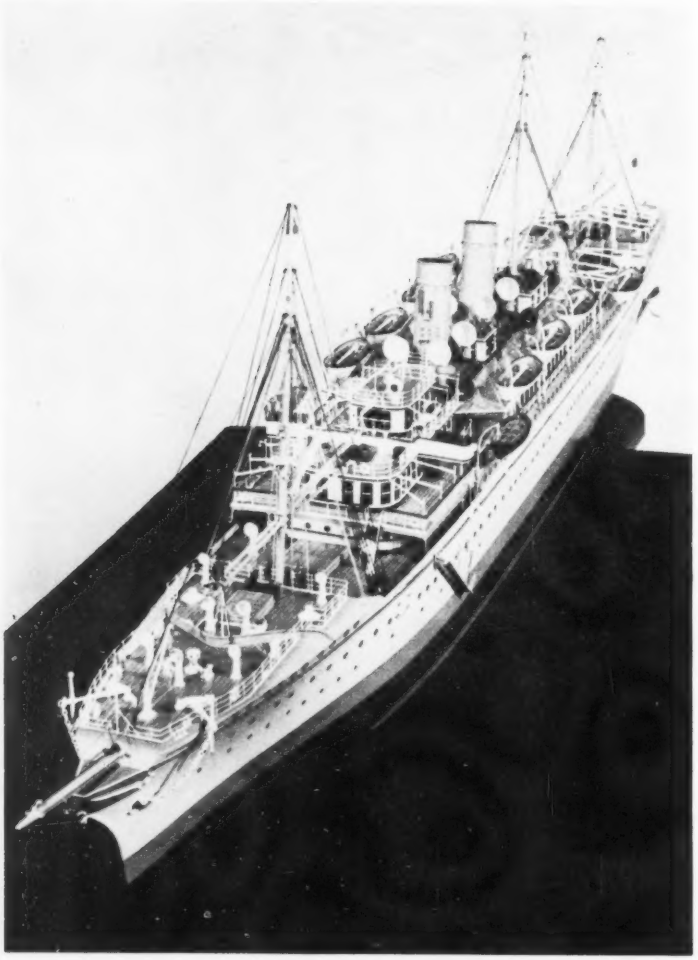
There were 15 entries in the Sailing Ships of Any Period (non-working) Class and the champion here was the tea clipper ARIEL built to a scale of 1/8th inch to the foot. The builder of this model has been exhibiting at the Show for many years and has won two cups. His work in both wood and metal is superb and paintwork is clean as well as free from blobs and nibs. His davits were beautifully made and all parts that move on the prototype were faithfully reproduced. The steering gear was reproduced correctly and was connected to the rudder. All running gear was lead from aloft to the belaying pin through blocks and fairlead, and on each pin was sufficient coil of rope for normal use. Every link of the anchor chain had the stud soldered in and other items - though small in relative importance - contributed to the accuracy of the finished job. The building time of several years demonstrated that it is more worthwhile to make one complete model that is outstanding rather than try to do as well in a year and botch up the job.

An early 16th century Spanish merchantman constructed to 3/16th inch scale was awarded a silver medal. This was based on the SANTA MARIA model in the Science Museum in London. The work was very well finished, clean painting, nicely rigged and with well made sails. A bronze medal was awarded to a model of Captain Cook's ENDEAVOUR bark. This was a very nicely made model. The hull was

Models appearing in the Marine Section of the 31st Annual Model Engineer Exhibition sponsored by the Percival Marshall Co. Ltd.



SHIPMODELS BUILT BY MEMBERS OF THE
NAUTICAL RESEARCH GUILD.



EMPRESS OF JAPAN built by J. A. Claridge

Built to scale of 1/8" to 1' Overall length 65"

Model of ship built during the transition period - between clippers and modern steamers. Original vessel had clipper type hull of iron construction, three masts initially fitted with sails.

From the shop of Vincenzo Lusci

New England fishing craft
by R. W. Taber

left unpainted to show off the planking. Rigging and masting details were exceptionally clean. In this section was a 1/4 inch scale model of a 40 gun frigate to show plank on frame construction. Though made to this large scale, the model did not stand comparison with the ARIEL or the Spanish merchantman. Perhaps the rough appearance of the model could have been reduced by using a more suitable timber than open grain oak.

In the class of working yachts and sailing ships was a Brixham Trawler VALERIAN built by an architect. The great amount of well executed detail aroused a lot of admiration. The "Maze Challenge Cup" for vessels built prior to 1820 was won by a model of the Revenue Cutter BUTTERCUP built to a scale of 1.2 inch to the foot. Fitted with studding sails and ringtail, with the usual armament found on such craft, she dwarfed surrounding models. Interior details included a table, with sextant and chart thereon, in the cabin. Finally, there was a Cochin-China "Gay-Boa" that was awarded a bronze medal.

The minature ship section was the largest single class. In this class, length of hull must not exceed 9 inches for 1/8" to 1 foot, or larger; 10 inches for 1/16" scale; 12 inches for 1/25" scale; and 15 inches for 1/32" scale. No limit for smaller scales. The organizers and judges must have a difficult job to arrive at a solution that will please everyone, but there is some objection to this rule since it is felt that the term "minature" should refer to the scale only and there should be no loophole for some to work 1.8" scale while a builder of the QUEEN ELIZABETH for example would be limited to a scale of less than 1/32" to the foot.

The championship cup in this class was won by a 100' to the inch model of the Italian liner CRISTOFORO COLOMBO. Despite the small scale, the model "looked complete". The finish was very neat and the modeller did not adopt the scenic action method of presentation, but preferred a still life portrayal of the vessel. A bronze medal was awarded to a model of cargo ship AFRICA PALM which was more of an "action" model. The only other recognition given by the judges to models in this section were diplomas of various standards.

A very effective model was of a whale hunt showing the harpooner of a New Bedford whaler with his first harpoon home and ready to launch the second at the whale which had its flukes towering over the flimsy boat. The diminutive crew were presented in varied garb associated with the old sailors. Though the display did not receive a higher award than "Very Highly Recommended", it attracted a lot of public attention.

An early 16th century trading vessel was on display and had a crew dressed in appropriate costumes, but were not really needed to add realism as the model was mounted on chocks. There were also two other models shown that were built by the same craftsman. Both were well finished. One was a two masted trading smack of about 1890 and the other a two masted topsail schooner of about 1880. Both were constructed on a 1/16" scale, planked on frame and with coppered hulls below the waterline.

Among the loan exhibits were models from previous cup winners and these unfinished works gave visitors ideas of what future champions look like in the formative stages. One of these was the LA LICORNE, 1/4" scale frigate, with frames and timbering beautifully in place. Another case contained two Severn Trows which will form part of a scenic display of a Severn side quay to show craft of the late 18th century.

Demonstration stands contained modelbuilders showing visitors how to set about various aspects of modelling. Some of these were Mr.G.H.Draper who lectured on the preparation of timber and demonstrated use of various jigs and tools. Another was Mr.H.W.Beesley demonstrating hull construction with a hull of a drifter partly completed. Mr.J.T.Brittain was also present to instruct in minature sail making and drafting of a suit of sails for a particular model. Mr. R.J.Collins, whose article on an early 18th century sixth rate frigate -now appearing serially in "Ships and Ship Models" was there to cover modelling a period ship.

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A SEARCH FOR NAVAL TIMBER

by Thomas Hornsby

During the middle of the nineteenth century, when the scarcity of domestic lumber suitable for ship-building was becoming more apparent, attention began to be paid to the discovery and procurement of substitute material. The American types used for this purpose: pine, oak, fir, larch, cedar, ash, locust, elm, walnut, gumwood, hackmatack, etc., served well enough, but some were in increasingly short supply.

Ten years before the Navy Department took official recognition of the problem, a few of the commanders of vessels at sea, and particularly those on foreign stations, made efforts to find substitutes useful for shipbuilding purposes. Actually the problem was an old one and had plagued the naval establishments of all the great maritime powers for many years. William Penn, in the early 1680's, standing before the great forests of Pennsylvania, had directed, "the tall straight trees, shall be saved for masts".

Commodore William Mervine, who issued the order for this short trip and exploration, was then in command of the Pacific Squadron, consisting of the INDEPENDENCE 50, ST. MARYS 22, JOHN ADAMS 20, DECATUR 16, Steamer MASSACHUSETTS 9. He was a veteran of the War of 1812, having entered the naval service as a boy in 1809. Lieut. J.B. McCauley, whose report follows, was born in Pennsylvania, and had entered the serice in 1840, having already served 17 years, of which only two and one half years were spent ashore. The year following finds him stationed at Philadelphia aboard the receiving ship PRINCETON 2; records do not indicate that he served in the Civil War, nor was I able to find the details of his subsequent career.

U. S. Flagship INDEPENDENCE
Bay of Panama March 3, 1857

Sir:

In obedience to your order to procure specimens of timber in the region of the Gulf of San Miguel and the Rio Darien, I left the INDEPENDENCE on the morning of the 4th of February in the first Cutter, with asst. Surgeon H.C. Caldwell, Carpenter G.W. Elliott, Dr. M.B. Halsted, an American citizen for many years a resident of this country, and twelve men-On this day I ran with a fair wind to Point Gorda, a distance of eighty miles, where I anchored for the night. During the following three days we experienced light airs and calms, and the remaining distance about thirty-five miles to Chepagana, was made mostly with the oars and the tide. The Gulf of San Miguel is a fine, large and protected harbor. It contains several islands covered with verdue; numerous small streams flow into the Gulf from all directions and its shores are lined with forests of timber. On Sunday the 8th, I arrived at Chepagana, a small village on the left bank of the Rio Darien, about eight miles above its mouth, and twenty-five from the Ocean. Up to this point the river is navigable for the largest vessels without a pilot, there being no obstructions whatever.

On Monday the First Cutter visited the Rio Savanna, a stream which flows into the Darien from the northward about two or three miles above where the latter becomes the Gulf of San Miguel and on this stream the specimens from one to twenty-nine inclusive were obtained. In the description of the specimens, the firs diameter given is that taken clear of the swell of the root from six to ten feet above the ground; the length was measured and is given only to the first limb, at which point the second diameter was taken. It is necessary to remark that the largest trees in most instances were not obtained for the following reasons - first, from the dense and tangled undergrowth of the forest, a search for larger timber than those immediately on the river bank would have required much time, and secondly, when found it would have occupied nearly a day to cut down and saw off a specimen, particularly of the very hard woods.

One tree of specimen No. 6, measured by Mr. Elliot the Carpenter, was six feet in diameter, but for the reason just stated a smaller tree was preferred. This wood which is abundant Mr. Elliot thinks the best ship timber he ever saw. The average size to which these trees grow has been furnished by Mr. Hosack, whom I had employed as a guide, a ship carpenter by profession but at present engaged in cutting and sawing Mahogany for the Panama market - he is a native of Scotland but has been a resident of this country for twelve years.

The character of the soil where the specimens were obtained, was in all cases the same, a rich vegetable mold not wet at this season but exposed to contant rain during nine months of the year. The leaves of each tree were collected and carefully dried by Dr. Caldwell and accompany the specimens of wood marked with similar numbers. There are many more valuable woods in this region of which specimens could have been obtained had time permitted. The country is very thinly settled, Chepagana containing but thirty-eight huts, and there are but three or four others between this village and the Ocean. We saw no signs of cultivation whatever. The natives are a semi-barbarous people, a mixture of the Spanish Indians and Negro races partaking more of the character of the latter. They subsist chiefly on game, which is abundant, with plantains, potatoes and rice, all of which in this rich soil grow with little care of attention.

Specimens of wood from the Rio Savanna

No. 1 VERBA - Diam. 2 feet-height 70 feet. Top diam. 16 inches, a good limb knee at crutch; large branches; said to be very durable exposed to air and water, used in house carpentry, has much milky sap.

No. 2 NIEPERO REAL - Diam. 15 inches, height 60 feet, top diam. 8 inches - branches small, grows not larger than 2 feet diam. Very durable, bears a fruit which is eaten and is of good flavor. A second specimen of this wood I took from an old Spanish fort at Chepagana- it formed part of the sill of an embrasure. The sill was perfect, although it must have been exposed to the weather more than a hundred years.

No. 3 CAVEMBRA (Copaiba) Diam. 13 inches, height 50 feet -top diam. 10 inches, no large branches, grows very large; Captain Marshall of H.B.M. Steamer VIRAGO, had a fine gig made on board from the wood of this tree.

No. 4 NUNO Diam. 26 inches, height 43 feet, top diam. 18 inches, grows to 8 or 10 feet diam. with large limbs and is very durable.

No. 5 ROALE Diam. 14 inches, height 30 feet, top diam. 10 inches - grows to about 4 feet diam. - very durable.

No. 6 ESPABE Diam. 2 feet 8 inches, height 50 feet, top diam. 2 feet, large branches, measured one of these trees 6 feet in diam. Resemble the white oak of the U.S., has large limbs and root knees. Mr. Elliot thinks it the finest ship timber he ever saw. Used for canoes and is very durable.

No. 7 PANAMA Diam 2 feet, height 70 feet, top diam. 14 inches - bears fruit.

No. 8 SIETE CUREA Diam. 2 feet, height 50 feet, top diam. 13 inches. Section presents a series of concentric rings, exuding a dark red rosin, very astringent - used only for fire wood.

No. 9 CARUNO Diam. 20 inches, height 90 feet, top diam. 13 inches - grows to 5 or 6 feet diam. with large limbs - very durable, used for house carpentry.

No. 10 CIGUA Diam. 14 inches, height 40 feet, top diam. 10 inches - grows from 5 to 6 feet in diam. Very durable, used for canoes.

No. 11 CAMITA Diam. 14 inches, height 40 feet, top diam. 10 inches, no large branches - much milky sap, does not generally grow large. The white sap which flows when this tree is cut, in a few moments becomes thick, tough adhesive, stringy and remains perfectly white having the appearance of white lead but very tough.

No. 12 CEDRA CEBALLO Diam. 2 feet, height 60 feet, top diam. 18 inches - has very large branches, durable, used for house carpentry - grows to a large size.

No. 13 ALCONOCO Diam. 12 inches, height 25 feet, top diam. 8 inches. Grows to 2 feet diam. with large branches, very durable, seed is large and shaped like a clam.

No. 14 LO REAL Diam. 12 inches, height 70 feet, top diam. 8 inches, Grows to 2 feet diam., very tall and straight, very durable.

No. 15 PALO SANGRA Diam. 2 feet, height 45 feet, diam. 18 inches, dark red sap. Has small branches, very durable, grows to 3 and 4 feet diam.

No. 16 CUAJADO Diam 12 inches, height 30 feet, top diam. 7 inches. Has small limbs, durable, grows to 3 and 4 feet diam.

No. 17 MADRANO Diam. 12 inches, height 50 feet, top diam. 6 inches, small limbs, durable, grows to 2 or 3 feet diam.- used for posts.

No. 18 CEDRO MACHO Diam. 2 feet, height 50 feet, top diam. 18 inches, large limb knees at crutch, grows to 3 or 4 feet diam.- bark used by natives as a purgative.

No. 19 GUAYAVILLA Diam. 12 inches, height 60 feet, top diam. 7 inches, grows to 3 or 4 feet, diam., very durable.

No. 20 MORO PLANCO Diam. 25 inches, height 25 feet, top diam. 14 inches, grows large and is very durable.

No. 21 OLIVA Diam 2 feet, height 80 feet, top diam. p7 inches. A very good durable wood - grows from 3 to 4 feet in diam.

No. 22 GUAVA Diam 12 inches, height 30 feet, top diameter 8 inches. A good durable wood, throws out large branches, grows from 4 to 5o feet in diam.

No. 23 MAYO Diam. 12 inches, height 20 feet, top diam. 7 inches, good durable wood used for house frames, grows large, throws out large branches, has a white milky gum, and bears a nut eaten by wild hogs.

No. 24 GUYACAN Diam. 12 inches, height 30 feet, top diam. 9 inches, very durable, grows from 4 to 5 feet, throws out large branches.

No. 25 TAPALISO Diam. 12 inches, height 20 feet, top diam. 7 inches, Very durable and used for all exposed purposes, grows from 3 to 4 feet diam. Crooked and throws out large branches, bears a small black berry.

No. 26 NARANJILLO Diam 18 inches, height 25 feet, top diam. 12 inches. Very durable and used for all exposed purposes, grows 3 feet in diam., and throws out large branches.

No. 27 ALCABO Diam 12 inches, height 40 feet, top diam. 7 inches. Very durable, grows 4 feet in diam., branches not large, much used by the natives for all exposed purposes.

No. 28 ESPINOSA Diam 12 inches, height 30 feet, top diam. 7 inches, a heavy durable wood, remarkably so in water, grows very large and throws out large branches.

No. 29 ZORRA Diam. 2 feet, height 70 feet, top diam. 15 inches, grows very large a beautiful wood for ornamental purposes, seldom or never used because so hard.

No. 30 FRIGOLILLA Diam. 10 inches, height 30 feet, top diam. 7 inches, small branches, grows short and only 2 feet in diam.

No. 31 MANGLA (Mangrove) Diam. 18 inches, height 70 feet, top diam. 14 inches. Durable in dry, but not in exposed places, or in water, grows to 3 feet in diam. and very tall.

No. 32 MORADO Diam. 12 inches, height 25 feet, top diam. 10 inches, grows about 2 feet diam. Used as a dye wood.

No. 33 GORGOJO Diam. 18 inches, height 35 feet, top diam. 12 inches, grows large.

No. 34 MORILLO (Guayaquil) Diam. 12 inches, height 25 feet, top diam. 10 inches, used for ship-building and all exposed places.

No. 35 NANEI Diam. 14 inches, height 25 feet, top diam. 12 inches, grows about 2 feet in diam.

No. 36 FRIO Diam. 12 inches, height 35 feet, top diam. 8 inches, grows small, durable.

No. 37 YAYA Diam. 12 inches, height 35 feet, top diam. 7 inches, exudes a dark red sap, grows 20 inches diam., very durable.

No. 38 TREPILICO Diam. 10 inches, height 20 feet, top diam. 6 inches, exudes a white mikly sap which is much like cavulchauc.

No. 39 CATIVO Diam. 18 inches, height 20 feet, top diam. 14 inches. Grows in low soil much esteemed for its pitch, grows about 2 to 3 feet in diam., would make good spars. The pitch from this tree is thick, clear and transparent, the natives boil it with ashes and fill up the cracks and decayed places in old canoes, when it becomes very hard and does not melt in the sun.

No. 40 COCOBOLO Diam. 14 inches, height 25 feet, top diam. 12 inches, a very hard durable wood, grows about 18 inches diam., like many other woods, it is too hard to be worked by the natives, very beauticul when polished.

No. 41 This is the bark of a tree found in large quantities in Darien and would, I believe, make excellent paper.

No. 42 GUACHO - Small vine creeping along the ground and rooting at intervals, said to be a preventative and cure for the bite of a snake, as a decoction internally, and bruised leaves applied to the wound.

No. 43 COROVAL A poison used by the Indians on their arrows, is said to cause instant death to an animal struck by one of these arrows which are but 10 inches in length, and blown through a tube to a considerable distance and great accuracy.

No. 44 VEO Used as the COROVAL, but said to be different in its composition.

On the 25th I left Chepagana arriving on board the INDEPENDENCE on the 27th. The officers with me showed every desire to contribute to the success of the expedition, which I trust has proved satisfactory to you. The conduct of the men, altho working hard and much exposed has been commendable.

Very respectfully,

Commodore William Mervine
Comdg. U.S. Pacific Squadron

J. B. McCauley
Lieut. U.S. Navy

The Gulf of San Miguel, the scene of this expedition, is part of the Gulf of Panama, and is an inner prolongation known as Darien Harbor. Its location is only about seventy-five miles north of the Bolivian border. Within the space of a few years the Civil War occupied the attention of all those connected with naval affairs, and this survey, with others of a like character was quickly forgotten. In the immediate years after the war, there was a surplus of naval ships of all types, and what building was undertaken was only in the direction of completing the different monitor classes.

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BOOK REVIEWS

"CELESTIAL NAVIGATION FOR YACHTSMEN" by Mary Blewitt, Third Edition, Published by the Philosophical Library, New York (From "Yachting World", Iliffe & Sons, Ltd., London)

It has always been my contention that anyone can be taught celestial navigation. This little booklet of only 64 pages can be used to learn strictly amateur celestial navigation. Although of British origin it applies equally to American Hydrographic Officer (U.S. Navy) Publications. I do not agree with plotting a graph for sights. A much easier method is to shoot three to five sights in rapid succession and average them. I was taught to check the sextant index correction on the horizon or on a star, rather than on the sun. The horizon check, bringing the split image of the horizon into coincidence and reading the sextant error, is the most common and perhaps the easiest. However, I consider that PILOTING, which is more difficult to learn correctly, is of more practical use to the average yachtsman than celestial naviagation. This book does not go far enough to be of real value to a deep sea yachtsman. Reviewed by Captain C. E. Coffin, Jr., U.S.N., N.R.G.

"TORBAY TO LISBON 1956", published by the Times Publishing Co., London.

This publication consists of 31 pages, 11" x 8 1/2". and contains 31 photographs of the entries for the Sail Training race that took place in July. Sixteen of the photos are full page and include some very fine shots of the square rigged entries. The center spread shows the start of the race with the ships coming out of Torbay. At the end of the book, there is a list of the entries with official times taken. Being printed on art paper, the photographs are very clear and the publication will be popular with lovers of these vessels. Review by John Lang, N.R.G., MSNR

"THE AGE OF FIGHTING SAIL" by C.S. Forester, Published by Doubleday & Co., Garden City, New York (Price $5.00)

This is a story of the Naval War of 1812 between the United States and Great Britain. Although the work is basically a non-partisan review of a trying period of our nations progress and development, it lacks the dryness and boredom usually associated with such endeavors. In this work, Mr. Forester has presented both sides of the disagreement with equal directness and impartiality which may prove

shocking to readers who are only casually aware of the conflict. The diplomatic maneuvering, popular thoughts of the day, fears, fumbles, battles, heroes and bunglers are all presented with a realistic approach and simple manner. The principal and miner conflicts, campaigns and negotiations appear in as chronological order as possible, and the author does not hesitate to draw modern parallels with current events to illustrate matters of interest. There is ample material presented for the reader to acquire an overall picture of what transpired over a period of years, but certainly not in excess of actual need. The evaluation of American frigates of the CONSTITUTION class from the British viewpoint is most enlighting and the value of privateers to the war effort on both sides, quite surprising. This work is recommended as of interest to the serious as well as casual student of history. Staff Review.

"THE WORLD'S TANKERS" by Laurence Dunn, published by John De.Graff, Inc., 31 E 10th Street, New York 3, New York (Priced at $6.95)

This is a one volume cyclopedia devoted to a specialized class of cargo vessel. The author carefully and briefly traces the origin and development of such carriers from the Greek fire ships of A.D. 670, the 18th century Newchang Junks, the early sailing vessels, etc. to the most modern tanker. There are over 200 plates, drawings and profiles reproduced on heavy high grade paper and fully indexed. Drawings and illustrations are very sharp and the work should prove of interest to the minature ship model builder. The text is informative without being too technical, and covers all types of liquid bulk carriers constructed throughout the world. Although the work is not to be considered as a "recognition" handbook, the author has included silhouettes and photographs of the principal classes of tankers of all countries.

Review by J. W. Harbin

"THE DIARY AND LETTER OF JARED C. NASH, 1849" or "TO THE GOLDFIELDS AROUND THE HORN FROM MAINE TO CALIFORNIA IN THE SCHOONER 'Belgrade' compiled by Grace Nash Pearce and Renee Nash Hamilton, Published by R & S Letter Shop, 623 South Greenleaf Avenue Whittier, California (Price $1.00)

This small work of about twenty pages is packed with local color and descriptive details of a trip from Maine to California in 1849. Family papers have been arranged so as to present the journey in understandable order with ample notes to supplement the entries. The first part of the work is devoted to family letters and descriptive matter relative to building the BELGRADE. Methods of financing ship construction and details of the shipyard at Cherryfield help complete this part of the undertaking. The second portion of the work consists of the diary entries of Jared Nash. The most colorful item is certainly the lengthy description of Rio de Janeiro as it appeared in 1849, and there are many other references of day by day activity on shipboard. The concluding pages include recollections of Grace Nash Pearce which round off the booklet very nicely. Staff Review

BOOK OPPORTUNITIES

One member has recently advised he has a copy of C.G.Davis' book "SHIPS OF THE PAST" in good condition for $15. The Secretary still has some copies of Mountaine's Seaman's Vade-mecum for $1 post paid. There are also severl requests on hand for leads to where copies of John Stevens "BOOK OF OLD SHIPS". Please contact Secretary.

INTRODUCTION OF NEW MEMBERS

BEEBER, ARTHUR - 12 Hillsdale Avenue, Westlanke, Daly City, California ---- advises he is a naval ship draftsman, a modelbuilder and a member of the Pacific Marine Research Society, Mr. Beeber was introduced by Willis Nye, Membership Chairman, N.R.G.

BOREEL, G.L. - Wieselsekampweg 102, Apeldoorn, Holland -- is a ship model builder, artist and member of the Netherlands Modelbuilding Society. He is interested in 19th and early 20th century sailing ships from Cape Horners to fishing schooners. Mr. Boreel learned about the Guild indirectly from Dick Orr and more recently from Captain Martein.

FOX, CHARLES S. - 136 Shuttle Meadow Road, Plainville, Connecticut -- became acquainted with N.R.G. through William D. Wilkinson. His interest covers various periods, but is particularly interested in New England fishing vessels. Mr. Fox is an artist, ship modelbuilder and former member of the Boston Ship Model Society.

HARPER, JAMES R. - 4204 Yuma Street, N.W., Washington, D.C. --is a member of the Washington Ship Model Society and is interested in sailing vessels of the 1700-1860 era. Mr. Harper is a talented model builder and we hope to hear more from him on the subject.

HARRIS, IRWIN B. - 4939 Walnut Street, Philadelphia, Pennsylvania - is a member of the Philadelphia Ship Model Society and is sponsored by Dr. Douglas H. Robinson and Frank J. Watson, Jr. (Both N.R.G. and P.S.M.S.). Mr. Harris has special interest in the evolution of merchant ship types and builds models whenever possible He is a professional photographer and artist.

HUMPHREYS, OCRAN R. _ Kilmarnock, Lancaster County, Virginia --comes from a family with close connections in the maritime affairs of Chesapeake Bay. He advises "with canvas and oils, I am attempting to recapture some of the Chesapeake story that was made by sail, steam and motor - for I feel that here is romance and history second to none". We hope there will be an opportunity some day to report further on Mr. Humphrey's research.

MOGGI, Skipper HENRY -797 Bard Avenue, Staten Island 1, New York City, N.Y.- states he has raced yachts on Long Island Sound for many years and is a member of the International Star Class Racing Association as well as the East River Fleet. The Skipper also builds racing sailing models that are winners. He aspires to enter the 1960 Olympics in a 10' Dyer Class "D" Dinghey and claims that an experienced racing man who is 72 years young, need never grow old.

POWELL, EDWARD E. - 3913 Peckham Avenue, Bakersfield, California--is a model builder of modern ships and power yachts. Although Mr. Powell claims status as an amateur, he goes to great lengths to obtain authentic data about the craft he has chosen to reproduce in minature.

PROPELLER CLUB OF THE UNITED STATES, Port of Maine Maritime Academy, Maine Maritime Academy, Castine, Maine -- was introduced to the Guild by N.R.G. member Carl J. Hay, Midshipman at the Academy. President Daily indicates his organization is interested in the activities of the Guild and hopes at some future date to lend more active support.

REBER, DR. JAMES A - 4782 Doverdell Drive, Pittsburgh 36, Pennsylvania-- indicates he is a model builder interested in merchant sailing ships of the 19th century prior to advent of steam. Introduced to N.R.G. by Dick Orr.

ROBELEN III, WILLIAM G. - 5 Corinne Court, Wilmington 3, Delaware--states that he is busy learning about and building models of old wooden sailing ships.

ROSSEN, J. NORMAN - 3211 Ravensworth Place, Alexandria, Virginia--- is another member of the Washington Ship Model Society and is presently busy with research on Baltimore Clippers.

STEINFELDT, ERIC - 822 Vanderbilt Avenue, San Antonio 10, Texas --lists his activities as model builder and artist. He is a member of Society for Nautical Research and S.S.H.S.A. During the past summer while vacationing up and down the eastern seaboard, he visited John Lyman and wound up at N.R.G. headquarters. He had some beautiful photographs of the Houston waterfront at the turn of the century - and we hope to learn in more detail some day how he found the glass negatives - also reproduce some for your admiration.

SWARD, HAROLD A. - 2313 Nelson Street, Richmond 28, Virginia--was introduced to the Guild by Ronald Moore. He is a yachtsman with 25 years of experience in sail and motor-sailers. As time permits, Mr. Sward builds models of the steam-sail transition period (1860-1915) and engages in production of color-sound movies.

WAGNER, MARVIN A. - 508 1/2 South Main Street, Jersey Shore, Pennsylvania -- indicates his interest lies in ocean going sail ship (merchant and naval) of the European powers from 1588 to 1800 and all historical and technical data pertaining there to.

ADJUSTMENTS TO THE MEMBERSHIP ROSTER

JOHNSON, Lt.Cmdr. CARL E. --c/o USS MANATEE (AO-58), Fleet Post Office, San Francisco, California.

PIERCE, Jr., GEORGE ALLEN - 1707 Preston Road, Alexandria, Virginia (correction)

SMALLEY, KENNETH C. - Box 284, Marblehead, Massachusetts

LATEST ADDRESS WANTED FOR:

BLACKSTONE, HENRY - formerly of Daly City, California

HARTLEY, R. L. - formerly of Oklahoma City, Oklahoma

McNAMAR, EDWARD G. - formerly of Portland, Oregon

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QUERIES

106-1 from G.L.Boreel of Apeldoorn, Holland -- My next model will be a 1:66 scale of the Grand Banker BLUENOSE from Lunenburg. I want to plank it above the water-line and copper below. I have good drawings from America and Paris, but no infor-mation on the measurement of the planking. What is the usual width of lumber used? Here, they use 15-18 c.m., thickness being 40-60 m.m.

106-2 from inquirer who would like to learn of where he can obtain photographs of the wooden ship GERALD C. TOBY that was engaged in the sugar trade between Honolulu and San Francisco in 1905. Respond through Secretary.

106-3 from the Jamestown Festival Committee Director of Exhibits who is seeking information concerning navigation instruments suitable for use on reconstructions of the SUSAN CONSTANT, GODSPEED AND DISCOVERY (1607). Needed: illustrations and dimensions of a backstaff, a nocturnal, a pegged traverse table, a telescope and peloris, also on the lookout for suitable material relative to a map or chart of the period and a pinnacle.

The NAUTICAL RESEARCH JOURNAL is published by members of the NAUTICAL RESEARCH GUILD. Membership dues are $5.00 per annum and include all issues of the Journal published during the year, plus index of the current colume, plus copy of the latest Membership Roster. New members receive the numbers which have been previously issued in the current year.

Dues are payable January First of each year and are in force until receipt of the written resignation of the member. Opinions and assertions appearing in the Journal are the private ones of the writers. All rights are reserved and republication of material published should not be accomplished without the permission of the secretary.

The NAUTICAL RESEARCH GUILD is a non-profit and co-operative organization founded in 1928 by Harry D. Hamilton. All income of the Guild is used to defray publication and business expenses of the organization. No officer or member receives any monetary compensation for his contribution.

Secretary-Treasurer, James W. Harbin, Jr., 4110 Beall St., Landover Hills, Md.
Membership Chairman, Willis L. Nye, 3038 Bridge Street, Hayward, California
Assistant Secretary, Thomas Hornsby, 537 Boyer Road, Cheltenham, Pennsylvania
Asst. Chrmn. Mbrsp. Comm., F. J. Watson, Jr., 204 David Dr. A-1, Bryn Mawr, Pa.

The Secretary's Bi-Monthly Report to Members of The Nautical Research Guild

Once again we go to press somewhat later than planned, but in these days of "rush-rush" all over the place, it is the best that can be done. We hope to get the November-December number out before the close of the year, but that remains to be seen.

Sufficient material to complete the final number for 1956 is on hand, but certainly not enough for 1957. Now is as good time as any to start rounding up your notes and preparing them for Volume 9, coming up. Please remember that the GUILD is your organization and the Secretary prepares the JOURNAL with your favorite subjects in mind, and as available. It would help if articles were prepared in single space typing - one side of sheet only, but this is not necessary if typewriter is not handy. Means are available to transcribe script. Photographs or reproductions of paintings should be clear and sharp for best reproduction. Elaborate backgrounds for model photographs should be avoided as details of construction are lost in processing. Perhaps one of our photographer members will take the hint and prepare some instructions on the process for us.

In concluding this report, the secretary would like to note that the USS HARTFORD finally sank at her moorings in the Elizabeth River, Norfolk, Virginia. Latest reports on the CONSTELLATION at Baltimore indicate nothing has been accomplished so far to have her mounted in a permanent berth or restored. It is also understood that the OLYMPIA is in very poor condition at Philadelphia and is closed to visitors. Perhaps one of our Philadelphia members can give later information on her condition. The CONSTITUTION at Boston is perhaps in best condition of all, but even so a local member reported part of the ship was closed to visitors last summer.

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QUERIES (continued)

106-4 from John E. Nicholson of Manhasset, New York --who writes "A few years ago there came into my possession a very fine old teak wheel, brass-bound and of particularly good carving and workmanship. A brass pin about 1" in diameter and 12" long is fitted into a socket on the face of the rim. In reading John Masefield's "The Wanderer of Liverpool", he describes at length the building and details of this steel barque. Here is what he says about the steering wheel - "Chains and steering rods led from the barrel of this wheel to the bulwarks and thence aft to the quadrant on the rudder-head. Late in her career one of her Captains had a special brass spoke made to fit into the socket on the face of the wheel-rim so that a third man might help when she was steering badly, as in heavy running." I am writing to ask if this extra spoke is an unusual idea. Very possibly this wheel might be off the "Wanderer" as she was lost in shoal water in April 1907 and salvagers pretty well stripped her shortly thereafter."